

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of)
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Patent No. 5,931,855) File No. 447P
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Issued: August 3, 1999)
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For: SURGICAL METHODS USING ONE-) San Francisco, California
WAY SUTURE)
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AMENDMENT IN RE-ISSUE APPLICATION

Please add the following new claims to the patent:

28. A method for producing one-way, barbed sutures of flexible monofilament material, for use in holding patient tissue in which the one-way suture is inserted, comprising:

providing a suture filament material of about 100 to 500 microns,

using a precision-formed cutting blade, cutting into the side of the suture filament material at an oblique angle, to a pre-selected depth,

then removing the cutting blade to leave a barb on the side of the suture material with orientation in one direction of the suture, and

repeating the cutting step at a series of locations along the length of the filament material and at different positions around the periphery of the filament to produce a length of one-

way suture with barbs oriented in a common direction.

29. The method of claim 28, wherein the step of removing the cutting blade includes removing the blade in such a way as to cause the barbs to extend outwardly somewhat on the suture.

30. The method of claim 28, wherein the pre-selected depth of the barbs formed on the filament material is about 30 microns to about 100 microns.

31. The method of claim 28, wherein the cutting step is performed by a machine having a pair of parallel and moveable bars each with a plurality of cutting blades facing toward the suture material, the cutting blades being set at an oblique angle on the movable bars relative to the suture filament material, and including converging the bars with cutting blades inwardly and longitudinally relative to the suture filament material to form a series of barbs simultaneously.

32. The method of claim 31, wherein, on removal of the cutting blades, the bars are spread apart without longitudinal movement relative to the suture filament material, thus causing the formed barbs to extend outwardly somewhat on the suture.

33. The method of claim 28, wherein the step of cutting

into the suture filament material to form the barbs comprises using a pair of counter-rotating cutting wheels each having cutting blades on their outer surfaces, the cutting blades being set obliquely relative to the suture filament material which passes between the cutting blades, and including holding the suture filament material to impose a resistance against movement of the filament material with the motion of the cutting blades, the imposed resistance being sufficient to cause the cutting blades to cut into the sides of the filament material while still allowing the filament material to advance with the motion of the opposed cutting wheel, the imposed resistance also causing the barbs to extend outwardly somewhat on the suture.

34. The method of claim 28, wherein the barbs are formed at staggered positions along the filament material.

35. A method for producing one-way, barbed sutures of flexible monofilament material, for use in holding patient tissue in which the one-way suture is inserted, comprising:

providing a suture filament material of about 100 to 500 microns,

using a laser beam, machining the filament material to remove sections of material so as to produce barbs with orientation in one direction, thus producing a length of one-way suture with barbs oriented in a common direction.

[illegible]

providing a suture filament material of about 100 to 500
microns,

then removing the cutting blade to leave a barb on the side of the suture material with orientation in one direction of the suture, and

29. The method of claim 28, wherein the step of removing the cutting blade includes removing the blade in such a way as to cause the barbs to extend outwardly somewhat on the suture.

30. The method of claim 28, wherein the pre-selected depth of the barbs formed on the filament material is about 30 microns to about 100 microns.

31. The method of claim 28, wherein the cutting step is performed by a machine having a pair of parallel and moveable bars each with a plurality of cutting blades facing toward the suture material, the cutting blades being set at an oblique angle on the movable bars relative to the suture filament material, and including converging the bars with cutting blades inwardly and longitudinally relative to the suture filament material to form a series of barbs simultaneously.

32. The method of claim 31, wherein, on removal of the cutting blades, the bars are spread apart without longitudinal movement relative to the suture filament material, thus causing the formed barbs to extend outwardly somewhat on the suture.

33. The method of claim 28, wherein the step of cutting into the suture filament material to form the barbs comprises using a pair of counter-rotating cutting wheels each having cutting blades on their outer surfaces, the cutting blades being set obliquely relative to the suture filament material which passes between the cutting blades, and including holding the suture filament material to impose a resistance against movement of the filament material with the motion of the cutting blades, the imposed resistance being sufficient to cause the cutting blades to cut into the sides of the filament material while still allowing the filament material to advance with the motion of the

opposed cutting wheel, the imposed resistance also causing the barbs to extend outwardly somewhat on the suture.

34. The method of claim 28, wherein the barbs are formed at staggered positions along the filament material.

35. A method for producing one-way, barbed sutures of flexible monofilament material, for use in holding patient tissue in which the one-way suture is inserted, comprising:

providing a suture filament material of about 100 to 500 microns,

using a laser beam, machining the filament material to remove sections of material so as to produce barbs with orientation in one direction, thus producing a length of one-way suture with barbs oriented in a common direction.

36. The method of claim 35, wherein the barbs are at staggered positions along the suture.

37. The method of claim 35, wherein the barbs are formed in a spiral pattern on the suture.